

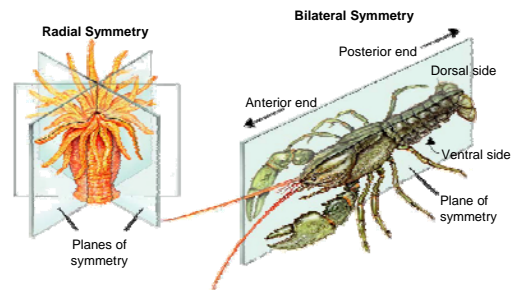
Invertebrate & Vertebrate Comparisons

*Biology Honors
Mrs. King*

- “The most well known phyla of kingdom Animalia are the
 - Mollusca,
 - Porifera,
 - Cnidaria,
 - Platyhelminthes,
 - Nematoda,
 - Annelida,
 - Arthropoda,
 - Echinodermata,
 - and Chordata, our own phylum
- There are more than 35 phyla in all, but these nine generally comprise the bulk of the kingdom”. Sidwell

What is the difference between radial and bilateral symmetry?

Body Symmetry



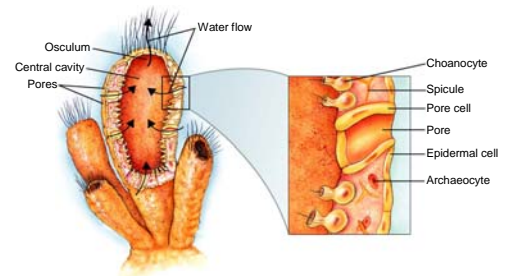
Sponges

Form and Function in Sponges

1. Body Plan
2. Feeding
3. Respiration, Circulation, and Excretion
4. Response
5. Reproduction

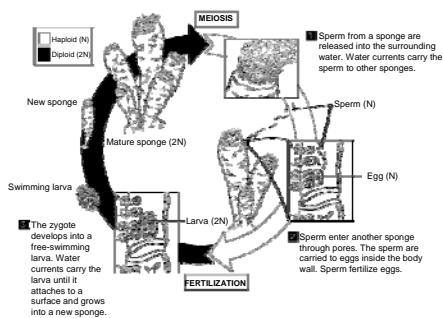
Ecology of Sponges

Sponge Anatomy



Simple body plan

Sponge Life Cycle



Cnidarians (*Marine Stingers*)

Form and Function in Cnidarians

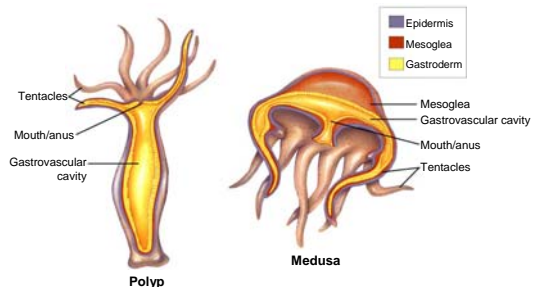
1. Body Plan
2. Feeding
3. Respiration, Circulation, and Excretion
4. Response
5. Movement
6. Reproduction

Groups of Cnidarians

1. Jellyfishes
2. Hydras and Their Relatives
3. Sea Anemones and Corals

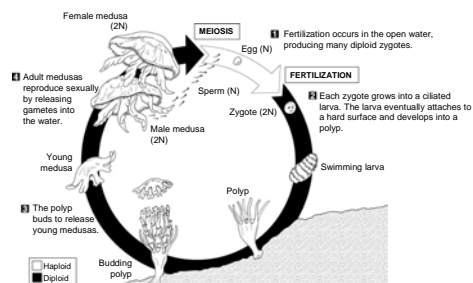
Ecology of Corals

The Polyp and Medusa Stages



Most common body plans

Jellyfish Life Cycle



Circulatory Systems

- **Open**
 - blood works its way through body tissues in spaces called sinuses
- **Closed**
 - blood always moves inside blood vessels

Flatworm

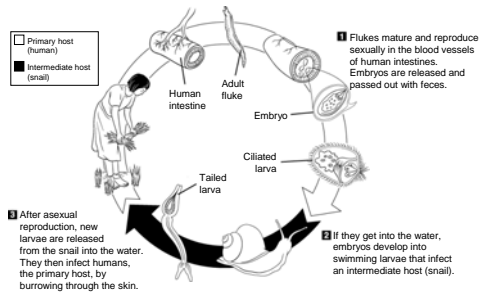
Form and Function in Flatworms

1. Feeding
2. Respiration, Circulation, and Excretion
3. Response
4. Movement
5. Reproduction

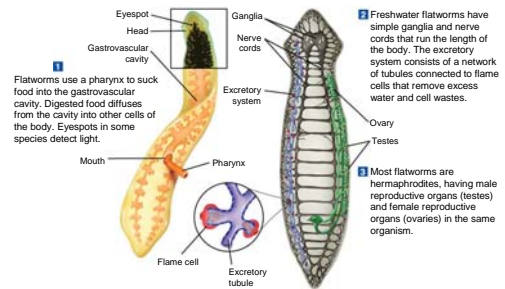
Groups of Flatworms

1. Turbellarians
2. Flukes
3. Tapeworms

Life Cycle of *Schistosoma Mansoni*



Flatworm Anatomy



Roundworms

Form and Function in Roundworms

1. Feeding
2. Respiration, Circulation, and Excretion
3. Response
4. Movement
5. Reproduction

Roundworms and Human Disease

1. Trichinosis-Causing Worms
2. Filarial Worms
3. Ascarid Worms
4. Hookworms

Research on *C. elegans*

Diseases Caused by Roundworms

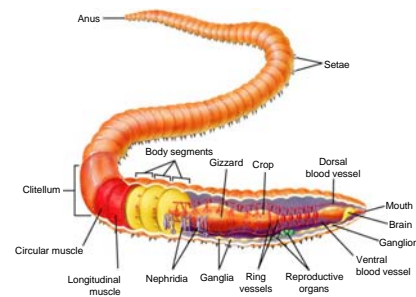
ORGANISM	DISEASE	ROUTE OF INFECTION	DESCRIPTION
<i>Trichinella</i>	Trichinosis	Eating undercooked meat containing larval cysts	Larvae burrow into tissues of host, causing pain
Filarial worms	Elephantiasis	Bite of insect carrying filarial worms	Worms block passage of fluids within lymph vessels, causing tissues to swell
<i>Ascaris</i>	<i>Ascaris</i> infection/infestation	Eating unwashed food contaminated with <i>Ascaris</i>	Worms in intestine block normal passage of food and absorption of nutrients
Hookworms	Hookworm infection/infestation	Bare skin in contact with contaminated soil	Worms attach to intestinal wall and suck blood, causing weakness and poor growth

Annelids

Groups of Annelids

1. Oligochaetes
2. Leeches
3. Polychaetes

Earthworm Anatomy



- Nephridium-
 - simple tube-shaped excretory organ used to remove ammonia from the blood and release it from the body.
- Clitellum –
 - secretes a ring of mucus which protects and supports eggs.

Compare/Contrast

Comparing Flatworms, Roundworms, and Annelids			
CHARACTERISTIC	FLATWORMS	ROUNDWORMS	ANNELIDS
Shape	Flattened	Cylindrical with tapering ends	Cylindrical with tapering ends
Segmentation	No	No	Yes
Body cavity	Acoelomate	Pseudocoelomate	Coelomate
Digestion and excretion	Gastrovascular cavity with one opening only; flame cells remove metabolic wastes	Tube-within-a-tube digestive tract; opening at each end; metabolic wastes excreted through body wall	Tube-within-a-tube digestive tract; opening at each end; nephridia remove metabolic wastes
Respiration	Through skin; no respiratory organs	Through skin; no respiratory organs	Through skin; aquatic annelids breathe through gills

Mollusks (*Soft Bodies*)

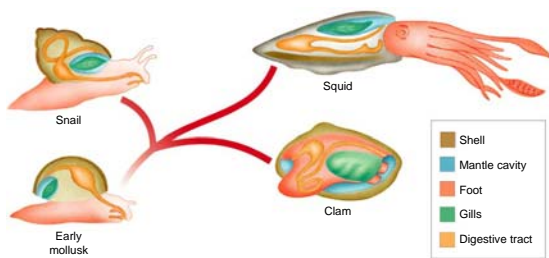
Groups of Mollusks

1. Gastropods
2. Bivalves
3. Cephalopods

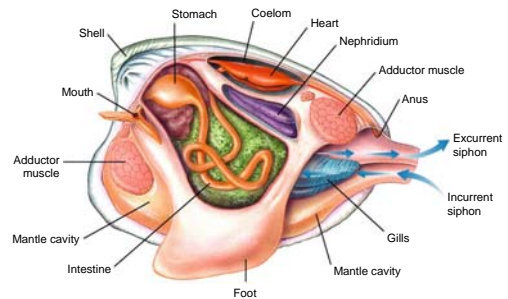
Compare/Contrast Table

Comparing the Three Major Groups of Mollusks			
MOLLUSK GROUP	SHELL	FOOT	EXAMPLES
Gastropods	Shell-less or single-shelled	Muscular foot located on ventral side and used for movement	Snail, slug, sea hare, nudibranch
Bivalves	Two shells held together by one or two muscles	Burrowing species have muscular foot. Surface-dwelling species have either no foot or a "reduced" foot.	Clam, oyster, mussel, scallop
Cephalopods	Internal shell or no shell	Head is attached to a single foot. The foot is divided into tentacles or arms.	Octopus, squid, cuttlefish, nautilus

Mollusk Body Plan



Clam Anatomy



Arthropods

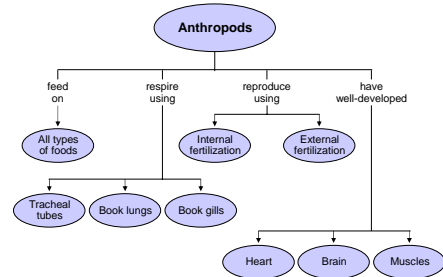
4 Major Subphyla

- **Trilobites** – dwellers in ancient seas
- **Chelicerates** – spiders, ticks, mites, scorpions, horseshoe crabs
- **Crustaceans**- crabs and shrimp
- **Uniramians**- centipedes, millipedes, and all insects including bees, moths, grasshoppers, flies, and beetles.

Diversity

- Chitinous exoskeleton
- Jointed appendages
- Segmented body

Concept Map

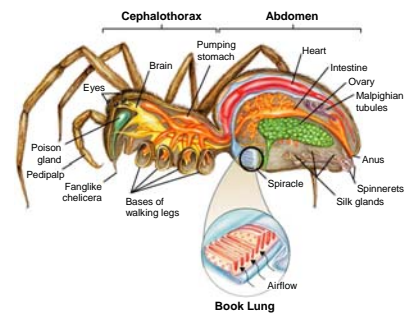


Trilobites

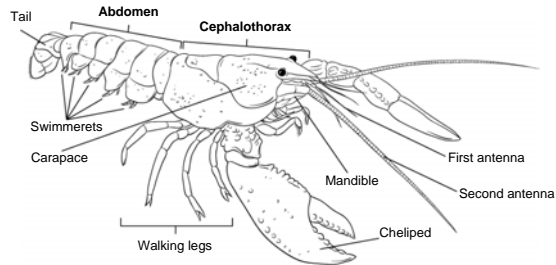
- dwellers in ancient seas



Chelicerates: Spider Anatomy



Crustaceans: Crayfish Anatomy

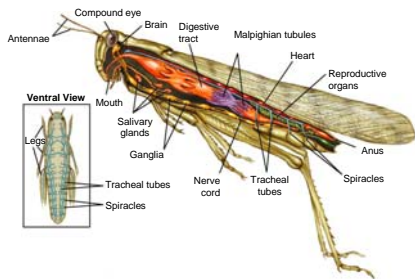


Cladocera - Water Flea

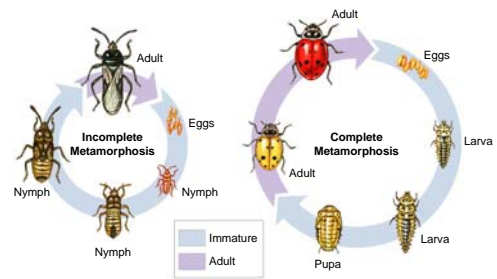


<http://mrskingsbioweb.com/Limnology.htm>

Uniramians: Grasshopper Anatomy

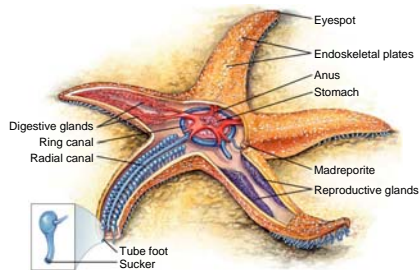


Metamorphosis



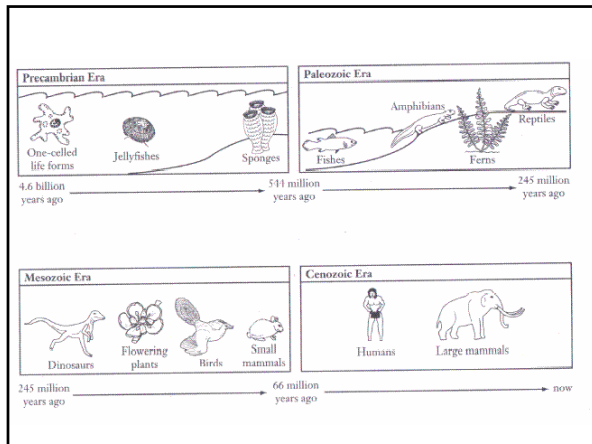
Process controlled by molting hormone

Sea Star Anatomy



Compare/Contrast

Comparing Groups and Major Characteristics of Echinoderms					
Characteristic	Sea urchins and sand dollars	Brittle stars	Sea cucumbers	Sea stars	Sea lilies and feather stars
Feeding	Detritivores	Detritivores	Detritivores	Most carnivores	Herbivores
Shape	Disc- or globe-shaped, no arms	Star-shaped, arms	Cucumber-shaped, no arms	Star-shaped, arms	Stalk with feathery arms
Movement	Burrow in sandy ocean bottom or wedge in rock crevices using moveable spines attached to endoskeleton	Move rapidly along ocean floor using arms	Move slowly along ocean floor using muscular body wall to crawl	Creep slowly along ocean floor using arms	Cannot move; attached to ocean bottom



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